

This Listing of Claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

Claim 1 (currently amended): Process for protectively coating an ejection chamber (35) of an ink jet printhead, to reduce damaging effects of aggressive inks, comprising the following steps:

step a): disposing of a die (20) comprising a silicon substrate (21) covered by a plurality of metallic and dielectric layers (23,24,25) in which is made an array of microcircuits for driving of thermal elements (22) for ejection of said ink, and also comprising a sacrificial metallic layer (26), provided with a cast (27) for at least one ejection nozzle (37), said sacrificial layer (26) and said cast (27) defining the inner shape of a chamber (35), of a feeding duct (36) connected to it and of said at least one nozzle (37);

step b): depositing on the outer surface of said sacrificial layer (26), through an electrochemical process, at least one metallic, protective coating layer (30);

step c): applying on said coating layer (30) a layer, the adhesion layer, (31) having a thickness preferably of about 1000 Å, to promote the adhesion of resins on said protective metals (30);

step d): depositing on said adhesion layer (31) a structural layer (32) of non-photosensitive epoxy or polyamide resin, having a thickness preferably between 20 and 60 µm, so as to completely cover said sacrificial layer (26), including the cast (27) of the nozzle (37);

step e): performing a polymerization of said structural layer (32) to increase its mechanical resistance to mechanical and thermal stresses;

step f): performing a planarization of the outer surface (33) of said structural layer (32), by way of a mechanical lapping and simultaneous CMP type chemical treatment (Chemical-Mechanical-Polishing), or other similar process, to uncover the upper cap (34) of the cast (27) of copper;

step g): removing said sacrificial layer (26) and said cast (27) by means of a chemical etching, using a highly acid bath, formed for instance of a mix of HCl and HNO₃ in a solution;

step h): depositing on the outer surface (33) of said structural layer (32), in a vacuum evaporation operation, a protective layer (39) of thickness preferably of approximately 1000 Å.

Claim 2 (currently amended): Process according to claim 1, wherein said metallic coating layer (30) is made of nickel-gold $[[;]]$.

Claim 3 (currently amended): Process according to claim 1, wherein said metallic coating layer (30) is made of palladium-gold.

Claim 4 (currently amended): Process according to claim 1, wherein said metallic coating layer (30) is made of ruthenium.

Claim 5 (currently amended): Process according to claim 1, wherein said protective layer (39) is made of a noble metal.

Claim 6 (currently amended): Process according to claim 5, wherein said protective layer (39) is made of chromium.

Claim 7 (currently amended): Process according to claim 8 1, wherein said protective layer (39) is made of magnesium fluoride and oxygen ($MgF_2 + O_2$).

Claim 8 (currently amended): Process according to claim 1, wherein said protective layer (39) is made of silica and chromium ($SiO_2 + Cr$).

Claim 9 (currently amended): Ink jet printhead, made of a silicon substrate (21) and a plurality of metallic and dielectric layers (23, 24, 25) deposited on said substrate (21), wherein a plurality of chambers (35) for ejection of ink droplets and of corresponding feeding ducts (36), connected to the former, is produced in one of said dielectric layers (32), said chambers (35) and said ducts (36) being delimited by at least one upper wall (35a), said upper wall (35a) communicating with at least one nozzle (37) for ejection of said ink droplets, ~~characterized in that~~ wherein said upper wall (35a) and an inner wall (37a) of said nozzle (37) are coated with at least one metallic

coating layer (30), suitable for increasing the resistance of said walls (35a, 37a) to chemically aggressive liquids, in contact with said walls.

Claim 10 (currently amended): Printhead as in claim 9, ~~characterized in that~~ wherein said upper wall (35a) communicates continuously with said inner wall (37a) of said nozzles (37).

Claim 11 (currently amended): Printhead as in claim 9, ~~or 10, characterized in that~~ wherein said upper wall (35a) is delimited by a concave surface.

Claim 12 (currently amended): Printhead as in claim 10, ~~characterized in that~~ wherein said inner wall (37a) of the nozzles (37) is delimited by a truncated cone shaped surface having its greater base disposed towards said upper wall (35a).

Claim 13 (currently amended): Printhead as in ~~one of the claims from~~ claim 9 ~~to 12,~~ ~~characterized in that~~ wherein said metallic coating layer (30) is made via a deposition of nickel and gold.

Claim 14 (currently amended): Printhead as in ~~one of the claims from~~ claim 9 ~~to 12,~~ ~~characterized in that~~ wherein said metallic coating layer (30) is made via a deposition of palladium and gold.

Claim 15 (currently amended): Printhead as in ~~one of the claims from~~ claim 9 ~~to 12,~~ ~~characterized in that~~ wherein said metallic coating layer (30) is made via a deposition of ruthenium.

Claim 16 (currently amended) Ink jet printhead, made of a silicon substrate (20) and a plurality of metallic and dielectric layers (23, 24, 25) deposited on said substrate (20), wherein a plurality of chambers (35) for ejection of ink droplets and corresponding feeding ducts (36), connected to the former, are made in one (32) of said dielectric layers, said chambers (35) and said ducts (36) being delimited by at least one upper wall (35a), said upper wall (35a) communicating with at

least one ejection nozzle (37) of said ink droplets, ~~characterized in that~~ wherein said chambers (35), said feeding ducts (36) connected to them and said at least one ejection nozzle (37) are made in the process according to ~~claims from~~ claim 1 to 8.

Claim 17 (currently amended): Process of protectively coating against aggressive liquids hydraulic microcircuits (35, 36, 37) made in a resin (32), comprising the following steps:

step a): disposing of a die (20) comprising a silicon substrate (21) covered by a plurality of metallic and dielectric layers (23, 24, 25), and also comprising a sacrificial metallic layer (26) defining the inner shape of said hydraulic microcircuits (35, 36, 37);

step b): depositing on the outer surface of said sacrificial layer (26), in an electrochemical process, at least one metallic, protective coating layer (30);

step c): applying on said coating layer (30) a layer, the adhesion layer, (31) having a thickness preferably of approximately 1000 Å, to promote the adhesion of resins on said protective metals (30);

step d): depositing on said adhesion layer (31) a non-photosensitive epoxy or polyamide resin (32), having a predetermined thickness and completely covering said sacrificial layer (26);

step e): performing a polymerization of said resin (32) to increase its mechanical resistance to mechanical and thermal stresses;

step f): performing a planarization of the outer surface (33) of said resin (32), through a mechanical lapping and simultaneous CMP type chemical treatment (Chemical-Mechanical-Polishing), or other similar process;

step g): removing said sacrificial layer (26) via a chemical etching, by means of a highly acid bath, formed for instance of a mix of HCl and HNO₃ in a solution;

step h): depositing on the outer surface (33) of said resin (32), in a vacuum evaporation operation, a protective layer (39).